

**COMPARATIVE ANALYSIS OF THE TENSILE STRENGTH OF
BAMBOO AND REINFORCEMENT STEEL BARS AS A STRUCTURAL
MEMBER IN CONSTRUCTION**

BY

CHELANGAT CALEB

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DECLARATION

I CHELANGAT CALEB declare that this research report is my original work and has not been submitted before to any university for any award.

Sign: .....

Date: ...03rd FEB 2023.....

Name: CHELANGAT CALEB

REG No: BU/UP/20191572

APPROVAL

This research by CHELANGAT CALEB was done under my supervision and is now ready for examination.

Supervisor

Sign: 

Date: 3RD / FEB / 2023

Joseph. A. Owalu

Lecturer Busitema University

Faculty of science and education

Department of physics

DEDICATION

I dedicate this work to my beloved father Mr. Labu Patrick for the great contribution he has offered to me towards my education.

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ACRONYMS

RCC reinforced cement concrete

UTM universal testing machine

kN 1000N

FB breaking force

ABSTRACT

The research study aimed at testing and comparing the tensile strength of bamboo and reinforcement steel bars as a structural member in construction. The tensile strength test was carried on reinforcement steel bars (high yield and mild yield steel bars) and bamboo of the same dimensions. Results were presented in tables and graphs and shows that the tensile strength of high yield steel bar is higher that of mild yield steel bar and bamboo respectively. The study concludes that due to the minimal breaking force (FB) of bamboo, it cannot be employed as the main structural member in construction instead can be used for partitioning walls, ceiling, roof and other parts of construction which do not carry a heavy load.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

The background idea that this study is built around is discussed in this chapter, along with the problem statement that identifies the kind of issue that this study will attempt to address. The goals, objectives, scope and the importance are also discussed in this chapter.

1.1 Background of the project

Bamboo and steel are structural materials with diverse engineering qualities used for the construction of structures and other construction related purposes. The fast growth and maturity rate of bamboo, sustainability, acceptability, its strength properties, low cost, makes its value investigative as a substitute structural material for steel. However, bamboo is demoted and undervalued to steel as a structural material in construction generally as such it has been mainly employed for fringe engineering purposes. The current study measured bamboo for its tensile strength and ability to carry load in comparison to steel to highlight its suitability or otherwise of bamboo as a substitute for steel as structural member in building construction. Due to a unique rhizome dependent system of growth, bamboo is known to have over 1200 different species worldwide which makes it a common and easily accessible material. It is also known to have been widely used in building construction in different parts of the world. Bamboo has a high compressive strength than wood, brick and concrete and exhibits a tensile strength that rivals steel. Bamboo has several properties of engineering material like steel used in construction but unlike wood, bamboo is known to have more evenly distributed yield stress strength this is due to the absence of ray and knots in its stem.

Today bamboo is used in building construction not only because of strength but other properties which makes it favorable for construction works such as resistant to pest, durability, elasticity and accessibility. Bamboo has been used in constructing walls, support structures, piers, roof, floor and room dividers amongst other things. Steel on the other hand has subject in the engineering construction because of its load bearing strength, yield stress strength and many others.

1.2 Problem statement

Construction refers to the techniques and industry involved in the assembly and erection of structures primarily those to provide shelter. Most of the materials used for construction include steel, concrete, wood, stones and bricks. The increasing prices for industrially produced

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